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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/682,443	09/04/2001	Michiel Jacques van Nieuwstadt	200-1758 JDR	9487

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EXAMINER

NGUYEN, TU MINH

ART UNIT	PAPER NUMBER
3748	5

DATE MAILED: 06/19/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No. 09/682,443	Applicant(s) Michiel Jacques Van Nieuwstadt
Examiner Tu M. Nguyen	Art Unit 3748

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on May 21, 2002

2a) This action is FINAL. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

4) Claim(s) 1 and 4-11 is/are pending in the application.

4a) Of the above, claim(s) _____ is/are withdrawn from consideration.

5) Claim(s) _____ is/are allowed.

6) Claim(s) 1 and 4-11 is/are rejected.

7) Claim(s) _____ is/are objected to.

8) Claims _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on Sep 4, 2001 is/are a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) The proposed drawing correction filed on _____ is: a) approved b) disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.

12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some* c) None of:
1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

14) Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).
a) The translation of the foreign language provisional application has been received.

15) Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) Notice of References Cited (PTO-892) 4) Interview Summary (PTO-413) Paper No(s). _____

2) Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) Notice of Informal Patent Application (PTO-152)

3) Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____ 6) Other: _____

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DETAILED ACTION

1. An Applicant's Amendment filed on May 21, 2002 has been entered.

Claims 2 and 3 have been canceled. Claims 5 and 7-9 have been amended. Claims 10 and 11 have been added. Overall, claims 1 and 4-11 are pending in this application.

Drawings

2. The drawings are objected to because in Figure 2, numeral 29 at the decision block to compare T_EXO and T_EXO_THRES should be removed since numeral 29 is already used in a multiplier block. Correction is required.

Specification

3. The abstract of the disclosure is objected to because on line 5, "here" should be removed. Correction is required. See MPEP § 608.01(b).

4. The disclosure is objected to because on
 - Page 4, paragraph 0012, line 1, "/" should read --.--.
 - Page 4, paragraph 0014, the sentence is incomplete.

Appropriate correction is required.

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Claim Objections

5. Claims 4 and 6 are objected to because of the following informalities:

- Claim 4, line 4 of the claim, "and" should be deleted.
- Claim 6, line 5 of the claim, --and-- should be inserted following "threshold,".

Appropriate correction is required.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

7. Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by King et al. (U.S. Patent 6,167,698).

King et al. disclose a method for controlling hydrocarbon injection into an engine exhaust to reduce NOx, comprising injecting the hydrocarbon into the engine exhaust in accordance with detection of a light-off event (lines 19-30 of column 3).

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8. Claims 4-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Hirota et al. (U.S. Patent 5,201,802).

Re claims 4-6 and 10, as illustrated in Figures 6 and 14-18, Hirota et al. disclose a method for controlling hydrocarbon injection into an engine exhaust to reduce NOx in such exhaust, such engine exhaust with the NOx and the injected hydrocarbon being directed to a catalyst (6) for reaction therein, comprising:

(a) detecting a temperature difference (Δt) indicating an exothermic reaction across the catalyst (step 608);

This is claim 5
(b) comparing the temperature difference with a predetermined temperature threshold (ΔT_i) (step 610);

(c) determining an exothermic condition temperature (T_2) at an output of the catalyst when the temperature difference is determined to exceed the threshold (step 614, Figure 17);

(d) comparing the determined exothermic condition temperature with an exothermic condition temperature (550 in Figure 17) expected from the catalyst at a time prior to the determined exothermic condition temperature; and

(e) modifying the injected hydrocarbon in accordance with the last-mentioned comparison (steps 618 and 620; also see Figure 18 and line 10 of column 9 to line 3 of column 10) (Hirota et al. determine in advance a desired lower limit catalyst inlet temperature T_1 and a desired upper limit catalyst outlet temperature T_2 for the optimum reduction of NOx as a function of the degradation extent DR (Figure 17). For a non-deteriorated catalyst, T_1 and T_2 equal 450 and 550, respectively. If a detected temperature difference (Δt) across the catalyst is different from a

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predetermined temperature threshold (ΔT_i), a degradation extent DR is calculated (step 612); and a set of desired temperature values T1 and T2 are determined based on the calculated DR (step 614). A hydrocarbon concentration H1 is also determined based on DR).

Re claims 7 and 9, as shown in Figures 6 and 14-18, Hirota et al. disclose a system and a processor (10) for controlling hydrocarbon injection into an engine exhaust to reduce NOx in such exhaust, such engine exhaust with the NOx and the injected hydrocarbon being directed to a catalyst (6) for reaction therein, the system comprising:

- (a) a catalyst (6) for facilitating a reaction between the injected hydrocarbon and NOx in the exhaust;
- (b) a hydrocarbon injector (14) for injecting the hydrocarbon into the exhaust upstream of the catalyst;
- (c) a detecting system comprising:
 - a pair of sensors (24, 20) each detecting a common parameter in the exhaust, one of such sensors being upstream of the catalyst and the other one of the sensors being downstream of the first sensor; and
 - a processor (10) for controlling the hydrocarbon injector in response to the pair of sensors, such processor being programmed to:
 - comparing a difference (Δt) in the common parameter detected by the pair of sensors with a predetermined temperature threshold (ΔT_i) (step 610);

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- determining an exothermic condition (T2) at an output of the catalyst when the difference in the common parameter is determined to exceed the threshold (step 614, Figure 17);

- comparing the determined exothermic condition with an exothermic condition (550 in Figure 17) expected from the catalyst at a time prior to the determined exothermic condition; and

- modifying the injected hydrocarbon in accordance with the last-mentioned comparison (steps 618 and 620; also see Figure 18 and line 10 of column 9 to line 3 of column 10) (Hirota et al. determine in advance a desired lower limit catalyst inlet temperature T1 and a desired upper limit catalyst outlet temperature T2 for the optimum reduction of NOx as a function of the degradation extent DR (Figure 17). For a non-deteriorated catalyst, T1 and T2 equal 450 and 550, respectively. If a detected temperature difference (Δt) across the catalyst is different from a predetermined temperature threshold (ΔT_i), a degradation extent DR is calculated (step 612); and a set of desired temperature values T1 and T2 are determined based on the calculated DR (step 614). A hydrocarbon concentration H1 is also determined based on DR).

Re claims 8 and 11, in the system and method of Hirota et al., the common parameter is temperature and wherein the sensors are temperature sensors.

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Response to Arguments

9. Applicant's arguments with respect to the references applied in the previous Office Action have been fully considered but they are not persuasive.

Re claim 1, in response to applicant's argument that King et al fail to disclose injecting the hydrocarbon into the engine exhaust in accordance with detection of a light-off event (page 10 of Applicant's Amendment), the examiner respectfully disagrees. As pointed out on lines 19-30 of column 3, the reductant in the method of King et al. is not injected when the catalyst (40) is relatively cool and is outside its prime (or temperature) operating zone. Thus, when the catalyst of King et al. is within its temperature operating zone, or in other words, when a light-off event in the catalyst is detected, the reductant is injected into the engine exhaust.

Re claim 4, in response to applicant's argument that Hirota et al fail to detect a temperature of an output of the catalyst in response to the detected exothermic reaction (page 10 of Applicant's Amendment), the examiner again respectfully disagrees. As shown in Figure 14, Hirota et al. detect an exothermic reaction (Δt) across the catalyst (step 608) and detect a temperature (T_2) of an output of the catalyst in response to the detected exothermic reaction (step 614) (a desired temperature value T_2 is determined in response to the detected Δt).

Re claims 5-11, in response to applicant's argument that Hirota et al fail to determine an exothermic condition temperature at an output of the catalyst when the temperature difference is determined to exceed the threshold (page 9 of Applicant's Amendment), the examiner again respectfully disagrees. As clearly shown in Figure 14, Hirota et al. detect a temperature difference (Δt) indicating an exothermic reaction across the catalyst (step 608), comparing the temperature

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difference with a predetermined temperature threshold (ΔT_i) (step 610), and determining an exothermic condition temperature (T2) at an output of the catalyst when the temperature difference is determined to exceed the threshold (zero) (step 614, Figure 17). In Hirota et al., the threshold is zero so that any deviation between Δt and ΔT_i would result in a calculation of a desired exothermic condition temperature (T2) at an output of the catalyst (see step 614 and Figure 17) and a calculation of a new reductant injection (see step 618 and Figure 18).

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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Communication

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Tu Nguyen whose telephone number is (703) 308-2833.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Thomas E. Denion, can be reached on (703) 308-2623. The fax phone number for this group is (703) 308-7763.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-1148.

Tu M. Nguyen

TMN

Tu M. Nguyen

June 18, 2002

Patent Examiner

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Ths De
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